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ABSTRACT

This document summarizes results of province-wide achievement tests given in Alberta, Canada in June 1987. These tests evaluated student achievement in third grade science, sixth grade mathematics, and ninth grade social studies. The test questions for each subject area reflected Alberta's curriculum specifications for that subject. The grade 3 test covered process skills and subject matter; matter and energy; living things and the environment; and earth, space, and time. The test evaluated knowledge, appreciation, and understanding of the subject matter. The grade 6 test covered subject matter and problem-solving skills. The subject matter included number systems and operations; ratio and proportion, measurement and geometry; data management; and algebra. The test evaluated knowledge; comprehension; application; and speed and accuracy of computation. The ninth grade test included both multiple choice and essay items; it covered selected market economies; selected centrally planned economies; and industrialization in Canada. The test evaluated values, knowledge, and skills. This report is based on the results of 31,384 third-grade, 31,130 sixth-grade, and 27,731 ninth-grade students from public, separate, and private schools who took each test. Various statistics on each test are presented, including the percentage of students who performed at or above the minimum acceptable level and at or above the outstanding level. Guidelines for test interpretation and a description of setting standards are included. (JGL)

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Achievement Test Provincial Report

June 1987 Administration

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Student Evaluation and Records

Alberta
EDUCATION
September 1987

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The successful administration of the June 1987 Student Achievement Tests would have been impossible without the substantial contributions from many people, particularly the administrators, teachers, and students who extended their full co-operation.

The technical expertise and advice of the Test Review committees regarding design, development, and reporting have also been especially valuable. These committees have representation from:

The Alberta Teachers' Association
The Conference of Alberta School Superintendents
Alberta Universities
Alberta Education

The contribution of all these groups is gratefully acknowledged.

Frank Horvath
Director
Student Evaluation and Records Branch

STUDENT ACHIEVEMENT TESTING PROGRAM

Preface

Following each administration of the student achievement tests, a report of provincial results is prepared. This document is the report for the June 1987 administration. Each school and school jurisdiction also receives a report of test results for its students.

The *Provincial Report* consists of general information about the student achievement testing program, followed by information specific to each subject.

The Achievement Testing Program provides information significant at the provincial and local levels about student knowledge, understanding, and skills in relation to program objectives.

The achievement tests are specific to the program of studies prescribed by the Minister of Education. Curriculum specifications for each subject area, provided by the Curriculum Design Branch and the Language Services Branch of Alberta Education, identify the major content areas, the specific learning objectives within each area, and the emphasis that each objective is to receive. The test questions reflect these curriculum specifications.

The achievement tests, administered on a cyclical basis, are in four subject areas: language arts, social studies, mathematics, and science; and at three grade levels: 3, 6, and 9. In 1987, achievement tests were administered in Grade 3 Science, Grade 6 Mathematics, and Grade 9 Social Studies.

Following the achievement test administration in June of each year, the results are reported to each school jurisdiction. These district profiles include results for each school and each student. Individual statements of results are not issued to students.

This *Provincial Report* is designed to assist school administrators and teachers in interpreting their achievement test results.

Exemptions from the Achievement Testing Program

Under normal circumstances, the following students are exempt from achievement testing:

- Students who participated in Special Education programs
- Students who were taught the subject being tested in another semester or year
- Students enrolled in an English as a Second Language program.
- Students who were taught the specific subject being tested in a language other than English
- Students who received exemption as approved by the Director of the Student Evaluation and Records Branch

GRADE 3 SCIENCE ACHIEVEMENT TEST

General Description

The Grade 3 Science Achievement Test consists of 50 multiple-choice questions which are answered in the booklet in machine-scorable format. The time allotted for writing the test is 50 minutes. The test is divided into two parts of equal length in recognition of the need to provide Grade 3 students with a break. Therefore, each part has 25 multiple-choice questions with a time allocation of 25 minutes.

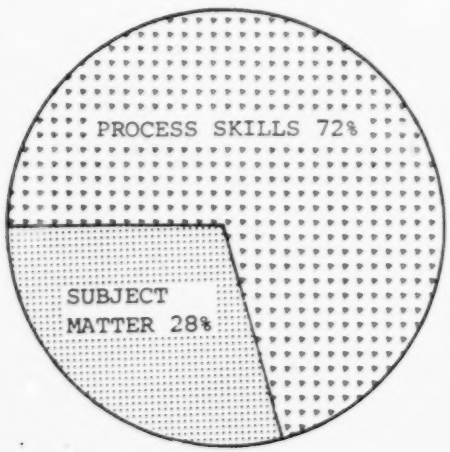
Content

The test is based on the *Grade 3 Science Curriculum Specifications* (Revised, August 1986). The four components of the Grade 3 curriculum are:

Components	Emphasis (%)
Process Skills	55
Subject Matter	20
Psychomotor Skills	15
Attitudes	10

Test questions are drawn from the process skills and subject matter components. The psychomotor skills and attitudes components should be reflected in the teacher's evaluation of the student.

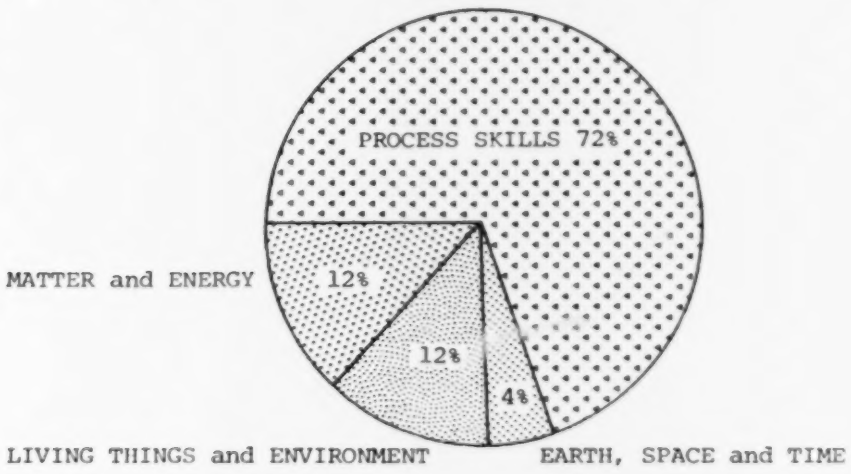
The emphasis given to the process skills and subject matter components in the Grade 3 Achievement Test is shown in the circle graph below:



The subject matter component includes questions from each theme in the Division I Science core. These themes are listed below.

1. Matter and Energy
2. Living Things and the Environment
3. Earth, Space, and Time

The emphasis given to each theme and to the process skills is shown in the circle graph below.



The test questions represent the cognitive levels of knowledge, application, and understanding.

Approximately 20% of the questions test knowledge of subject matter.

Approximately 80% of the questions test application and understanding.

It is assumed that students are familiar with the terminology used in the curriculum specifications (e.g. observing, predicting, measuring, classifying, mass, food chain, etc).

The Grade 3 Science Achievement Test is based on the Division I Curriculum Specifications and includes material covered in grades 1, 2, and 3.

Blueprint of the Achievement Test

The blueprint for the Grade 3 Science Achievement Test is presented in Table 1.

Table 1: Grade 3 Science - Test Blueprint:
Question Numbers and Per Cent Emphasis

Content	Questions by Cognitive Level		Test Emphasis (%)
	Knowledge	Application	
Subject Matter Matter and Energy	*45*	*19, 20, 21, 44, 46*	12
Living Things and the Environment	*23*	*22, 24, 47, 48, 49*	12
Earth, Space, and Time	*25*	*50*	4
Process Skills	*1, 7, 11, 16, 27, 30, 31*	*2, 3, 4, 5, 6, 8, 9, 10, 12, 13, 14, 15, 17, 18, 26, 28, 29, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43*	72
Test Emphasis (%)	20	80	100

Absentees and Exemptions

Table 2: Grade 3 Science - Students Tested, Absentees, and Exemptions

	Number of Students	Per Cent
Students tested	31 384	89.4
Students absent	1 067	3.0
Students exempt:		
Special Needs	676	1.9
Not taught subject this term	536	1.5
ESL Classes	273	0.8
Language of Instruction not English	1 152	3.3
Other (Approved by Director)	37	0.1
Total Exempt	2 674	7.6

Note: the data are incomplete as not all schools returned absentee and exemption reports.

RESULTS

The report is based on the results for 31 384 students from public, separate, and private schools.

Total Test

Since over 30 800 of the students completed the test, it was concluded that sufficient time was allowed to write the test. Test statistics in percentage points are as follows:

Provincial Average - 71.3
Standard Deviation - 15.9

The KR-20 reliability coefficient for the test was 0.86.

Standards for the Minimum Acceptable and Outstanding Performance Levels

The minimum acceptable and outstanding performance levels of achievement were established by a standard setting procedure*. For the Grade 3 Science Achievement Test the standards established were as follows:

To meet the minimum acceptable performance level, students must achieve a raw score of 24.

To meet the outstanding performance level, students must achieve a raw score of 44.

Based on these standards the results reveal that:

91.2 per cent of students performed at or above the minimum acceptable performance level.

15.8 per cent of students performed at or above the outstanding performance level.

Reporting Categories

The questions have been grouped according to reporting categories. Provincial averages for these categories and for the total test were computed and rounded to one decimal. Consequently, the sum of the averages is not exactly the same as the average for the total test. Provincial averages for these reporting categories and the total test are presented in Table 3 on page 6.

*An explanation of the standard setting procedure is given in Appendix A.

Table 3: Grade 3 Science - Provincial Averages for Total Test, Process Skills, and Subject Matter

Reporting Category	Number of Questions	Average (Raw Score)	Standard Deviation (Raw Score)
Total Test	50	35.6	8.0
Subject Matter			
Matter and Energy	6	4.0	1.4
Living Things and the Environment	6	4.6	1.3
Earth, Space, and Time	2	1.5	0.7
Process Skills	36	25.6	5.9
Cognitive Level			
Knowledge	10	7.0	2.0
Application	40	28.7	6.4

Frequency Distribution of Raw Scores

Table 4 presents the relative frequency and the cumulative frequency for each raw score. The range of scores was from 0 to 50. Any relative frequency or any cumulative frequency smaller than 0.05 was rounded to 0.0. For example, 5 students or 0.02% obtained a score of 6 but the relative frequency for this score is recorded as 0.0.

Table 4: Grade 3 Science - Frequency Distribution of Raw Scores

Raw Score	Relative Frequency* (%)	Cumulative Frequency** (%)	Raw Score	Relative Frequency* (%)	Cumulative Frequency** (%)
0	0.0	0.0	26	2.0	13.8
1	0.0	0.0	27	2.0	15.8
2	0.0	0.0	28	2.5	18.3
3	0.0	0.0	29	2.6	20.9
4	0.0	0.0	30	2.9	23.7
5	0.0	0.0	31	3.1	26.8
6	0.0	0.0	32	3.5	30.3
7	0.0	0.1	33	3.8	34.1
8	0.1	0.1	34	4.3	38.5
9	0.0	0.2	35	4.7	43.2
10	0.1	0.3	36	4.7	47.9
11	0.2	0.4	37	5.0	52.8
12	0.2	0.7	38	5.1	58.0
13	0.3	1.0	39	5.6	63.5
14	0.4	1.4	40	5.3	68.9
15	0.4	1.8	41	5.5	74.4
16	0.6	2.4	42	5.1	79.4
17	0.6	2.9	43	4.8	84.2
18	0.7	3.6	44	4.4	88.6
19	0.7	4.3	45	3.7	92.3
20	0.9	5.2	46	3.1	95.3
21	1.0	6.2	47	2.3	97.7
22	1.2	7.4	48	1.4	99.0
23	1.4	8.8	49	0.8	99.8
24	1.4	10.2	50	0.2	100.0
25	1.6	11.8			

*Relative frequency: the percentage of students who obtained each score.

**Cumulative frequency: the percentage of students who scored at or below each score.

Results for Individual Questions

The percentage of students choosing each response is given in Table 5. The correct response (key) for each question is also identified.

Table 5: Grade 3 Science - Results for Individual Questions

Item	Key	Distribution of Responses* (%)				Item	Key	Distribution of Responses* (%)			
		A	B	C	D			A	B	C	D
1	B	6.3	88.1	3.4	1.8	26	D	6.2	5.8	5.9	81.6
2	A	66.9	4.6	22.9	5.3	27	D	4.3	14.0	3.2	77.2
3	D	28.4	2.5	12.0	56.8	28	C	41.2	6.5	47.4	4.3
4	C	1.8	5.2	91.8	0.8	29	C	13.6	9.7	67.2	8.1
5	D	7.8	5.7	6.4	79.6	30	B	2.0	60.9	13.5	22.7
**6	A	68.4	16.6	N/A	N/A	31	A	80.2	6.8	4.9	6.9
7	D	12.3	7.3	15.9	63.6	32	C	5.7	4.1	87.0	2.2
8	B	2.1	58.3	19.9	19.0	33	A	65.5	14.7	16.2	2.2
9	A	93.6	2.6	1.2	1.4	34	A	84.8	5.0	3.0	5.4
10	D	11.5	4.6	8.1	74.6	35	B	19.0	70.5	3.5	5.8
11	D	5.6	8.9	11.4	70.2	36	B	2.2	91.7	2.1	2.1
12	C	12.5	17.3	62.1	6.9	37	D	5.7	10.3	13.5	69.1
13	A	71.7	10.7	5.0	11.8	38	B	10.7	45.0	8.0	35.6
14	D	2.6	4.8	2.2	89.7	39	C	10.1	12.9	67.4	8.5
15	B	2.6	69.4	24.6	2.7	40	B	2.4	94.6	1.4	0.6
16	A	38.4	29.6	8.9	22.0	41	C	17.1	9.0	63.9	8.3
17	C	2.0	5.6	57.2	34.5	42	C	6.2	14.1	71.8	6.6
18	C	5.7	16.3	52.8	23.9	43	A	76.5	5.3	3.7	8.4
19	B	8.5	69.3	8.0	12.9	44	B	14.7	59.0	10.7	11.5
20	C	33.1	3.2	50.0	12.6	45	A	68.1	7.7	5.4	15.6
21	B	3.1	77.1	2.0	16.5	46	D	3.7	6.8	15.4	73.1
22	B	8.9	77.7	1.5	10.7	47	A	93.8	1.7	1.9	1.5
23	D	8.9	14.1	3.8	71.3	48	C	2.9	6.0	87.8	2.0
24	C	6.0	6.1	74.6	11.3	49	B	18.7	57.9	9.2	12.3
25	A	79.4	6.0	5.0	7.6	50	D	6.6	8.8	14.5	68.4

*The sum of the percentages for each question may be less than 100% because the No Response category is not included. The No Response category does not exceed 6.0% for any one of these questions.

**Due to a technical problem, the distribution of responses for students choosing alternatives C and D are unavailable for Question 6.

Distribution of Jurisdiction Levels of Achievement

Table 6 indicates the percentage of jurisdictions classified as significantly above, not different from, or below the provincial average for each subtest.

Table 6: Grade 3 Science - Distribution of Jurisdiction Levels of Achievement

Reporting Category	Distribution of Jurisdiction Levels of Achievement		
	Below Provincial Average (%)	Not Different from Provincial Average (%)	Above Provincial Average (%)
Total Test	16.3	52.6	31.2
Subject Matter			
Matter and Energy	17.1	56.2	26.7
Living Things and the Environment	10.4	62.6	27.0
Earth, Space, and Time	11.2	73.7	15.1
Process Skills	17.3	54.2	28.5
Cognitive Level			
Knowledge	17.8	58.4	23.8
Application	16.0	53.1	31.0

GRADE 6 MATHEMATICS ACHIEVEMENT TEST

General Description

The Grade 6 Mathematics Achievement Test consists of two sections. Section 1 contains 55 questions covering numeration, operations and properties, measurement, geometry, graphing, and problem-solving strategies. Section 2 comprises five basic-fact tests in addition, subtraction, multiplication, division, and mixed operations. Each basic-fact test contains 48 questions.

The total time allotted for writing the test is 70 minutes: 60 minutes for Section 1, and two minutes for each basic-fact test in Section 2.

All questions are multiple-choice with four alternatives. Students answer questions on machine-scorable answer sheets for Section 1. For the basic-fact tests in Section 2, students answer questions in the test booklets by filling in a small circle beside the correct response. There was no separate answer sheet for basic-fact tests.

Content

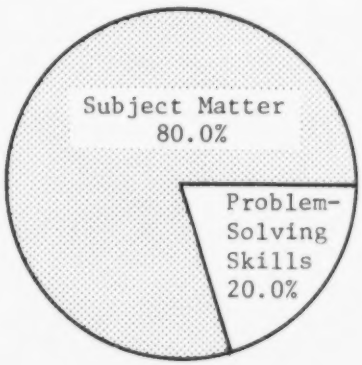
The test is based on the *Grade 6 Mathematics Curriculum Specifications* (revised May, 1986). The four components of the Grade 6 curriculum are:

Component	Emphasis (%)
Subject Matter	60
Problem-Solving Skills	20
Psychomotor Skills	10
Attitude	10

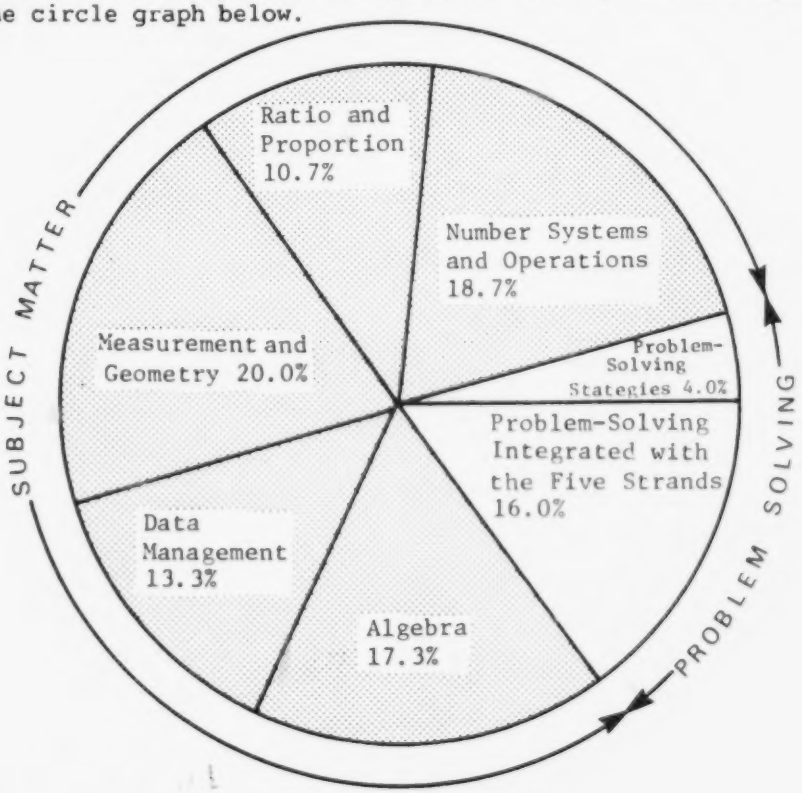
Test questions are drawn only from the subject matter and problem-solving skills components. The psychomotor skills and attitude components should be reflected in the teacher's evaluation of the student.

Section 1: Subject Matter and Problem-Solving Skills

The emphasis given to the subject matter and problem-solving skills components is shown in the circle graph below.



The subject matter component covers five strands: numeration, operations and properties, measurement, geometry, and graphing. The problem-solving skills component is divided into two parts: problem-solving integrated with subject matter and problem-solving strategies. The emphasis given to each subject matter strand and to each part of the problem-solving skills component is shown in the circle graph below.



Questions on subject matter measure student achievement at three cognitive levels: knowledge, comprehension, and application.

Blueprint for the Achievement Test

The question numbers and the per cent emphasis are presented in Table 7.

Table 7: Grade 6 Mathematics - Test Blueprint for Section 1: Question Numbers and Per Cent Emphasis

Content	Subject Matter by Cognitive Levels			Problem Solving	Test Emphasis (%)
	Knowledge	Comprehension	Application		
Numeration	*1,2,4,8 11,12*	*5,7,10*	*6,9*	*3,13*	24
Operations and Properties	*29*	*15,16,19,20, 23,24,26,27, 28*	*17,21,25, 30*	*18,22*	29
Measurement	*38,39, 40,41*	*31,33*	*34,35,37*	*32,36,*	20
Geometry	*45,48*	*43,47*	*46*	*44*	11
Graphing		*51,52*	*49,50,53*	54	11
Problem-Solving Strategies	-	-	-	*14,42, 55*	5
Section I Emphasis (%)	24	32	24	20	100

Section 2: Basic Facts

This section of the test consists of five timed tests. They measure student mastery of basic facts involving sums and minuends to 18, and products and dividends to 81.

The order of the basic-fact tests, the number of questions on each test, and the time allotted to write each test are presented in Table 8 below.

Table 8: Grade 6 Mathematics -
Test Blueprint for Section 2: Basic Facts

Operations	No. of Questions	Time (min)
Addition	48	2
Subtraction	48	2
Multiplication	48	2
Division	48	2
Mixed Operations	48	2

Absentees and Exemptions

Table 9: Grade 6 Mathematics - Students Tested, Absentees, and Exemptions

	Number of Students	Per Cent
Students tested	31 130	94.38
Students absent	1 074	3.26
Students exempt:		
Special Needs	585	1.77
Not taught subject this term	8	0.02
ESL Classes	115	0.35
Language of Instruction not English	2	0.01
Other (Approved by Director)	71	0.22
Total Exempt	781	2.37

Note: the data are incomplete as not all schools returned absentee and exemption reports.

RESULTS

The report is based on the results for 31 130 students from public, separate, and private schools. Results for *Section 1* and *Section 2* are reported separately.

Results for *Section 1* - Subject Matter and Problem-Solving Skills

Since over 30 500 of the students completed the test, it was concluded that sufficient time was allowed to write Section 1. Test statistics in percentage points are as follows:

Provincial Average - 69.7
Standard Deviation - 17.3

The KR-20 reliability coefficient for the Section 1 was 0.90.

Standards for Minimum Acceptable and Outstanding Performance Levels

The minimum acceptable and outstanding performance levels were established using a standard setting procedure*. For Section 1 of the Grade 6 Mathematics Achievement Test, the standards established were as follows:

To meet the minimum acceptable performance level, students must achieve a raw score of 24.

To meet the outstanding performance level, students must achieve a raw score of 50.

Based on these standards, results for Section 1 of the Grade 6 Mathematics Achievement Test revealed that:

92.1 per cent of students performed at or above the minimum acceptable performance level.

12.3 per cent of students performed at or above the outstanding performance level.

*An explanation of the standard setting procedure is given in Appendix A.

Results for Section 1, Subject Strands, Cognitive Levels, and Problem Solving

The questions have been grouped according to reporting categories. Provincial averages for each reporting category and for the total of Section 1 were computed and rounded to one decimal. Consequently, the sum of the reporting category averages is not exactly the same as the average for Section 1 (total). Provincial averages for these reporting categories and for Section 1 (total) are presented in Table 10.

Table 10: Grade 6 Mathematics - Provincial Averages for Section 1 (total), Subject Strands, Cognitive Levels, and Problem Solving

Reporting Category	Number of Questions	Average Raw Score	Standard Deviation (Raw Score)
Section 1 (total)	55	38.4	9.5
Subject Strand			
Numeration	13	9.0	2.7
Operations and Properties	16	11.3	3.2
Measurement	11	7.5	2.2
Geometry	6	4.1	1.4
Graphing	6	4.4	1.5
Problem-Solving Strategies	3	2.1	0.8
Cognitive Level			
Knowledge	13	9.5	2.4
Comprehension	18	12.7	3.5
Application	13	9.2	2.8
Problem-Solving Skills	11	7.0	2.4

Section 1: Frequency Distribution of Raw Scores

Table 11 presents total raw scores for Section 1 as well as the relative frequency and the cumulative frequency for each raw score. The range of scores was from 0 to 55. Any relative frequency or any cumulative frequency smaller than 0.05 was rounded to 0.0. For example, 13 students or 0.04% obtained a score of 8, but the relative frequency for this score is recorded as 0.0.

Table 11: Grade 6 Mathematics: Section 1
Frequency Distribution of Raw Scores

Raw Score	Relative Frequency* (%)	Cumulative Frequency** (%)	Raw Score	Relative Frequency* (%)	Cumulative Frequency** (%)
0	0.0	0.0	29	2.4	19.0
1	0.0	0.0	30	2.5	21.5
2	0.0	0.0	31	2.6	24.1
3	0.0	0.0	32	2.9	27.1
4	0.0	0.0	33	2.8	29.9
5	0.0	0.0	34	3.2	33.1
6	0.0	0.0	35	3.3	36.4
7	0.0	0.0	36	3.2	39.6
8	0.0	0.1	37	3.4	43.1
9	0.0	0.1	38	3.7	46.8
10	0.1	0.2	39	3.6	50.4
11	0.1	0.3	40	3.9	54.3
12	0.2	0.5	41	3.8	58.1
13	0.2	0.7	42	4.0	62.1
14	0.2	0.9	43	3.8	65.9
15	0.3	1.2	44	3.8	69.7
16	0.4	1.6	45	3.9	73.6
17	0.5	2.1	46	3.8	77.4
18	0.7	2.8	47	3.5	80.9
19	0.7	3.4	48	3.3	84.2
20	0.9	4.4	49	3.5	87.7
21	1.1	5.4	50	3.0	90.7
22	1.2	6.6	51	2.9	93.6
23	1.3	7.9	52	2.4	96.1
24	1.4	9.3	53	2.0	98.1
25	1.5	10.9	54	1.3	99.4
26	1.7	12.5	55	0.6	100.00
27	2.0	14.5			
28	2.1	16.6			

*Relative frequency: the percentage of students who obtained each score.

**Cumulative frequency: the percentage of students who scored at or below each score.

Section 1: Results for Individual Questions

The percentage of students choosing each response for each question in Section 1 is given in Table 12. The correct response (key) for each question is also identified.

Table 12: Grade 6 Mathematics: Section 1
Results for Individual Questions

Item	Key	Distribution of Responses* (%)				Item	Key	Distribution of Responses* (%)			
		A	B	C	D			A	B	C	D
1	C	5.4	3.4	85.4	5.6	29	C	10.7	10.2	65.0	13.6
2	D	3.5	23.1	6.6	66.6	30	B	28.9	59.4	8.8	2.6
3	C	11.2	23.0	60.1	5.5	31	B	4.0	91.1	3.0	1.6
4	C	19.5	12.0	59.6	8.5	32	A	41.2	24.9	9.1	24.2
5	C	6.7	14.4	58.0	20.8	33	C	22.2	3.6	39.1	34.8
6	C	16.1	3.4	73.0	7.3	34	B	2.6	61.1	17.1	18.7
7	A	59.1	7.5	2.1	31.1	35	B	7.5	66.8	14.1	11.1
8	C	14.8	7.9	64.6	12.5	36	C	34.1	7.7	53.5	4.2
9	D	8.5	8.9	15.0	67.2	37	D	3.3	3.8	6.9	85.4
10	D	7.6	16.5	7.5	68.0	38	A	65.9	23.2	1.6	8.9
11	D	9.7	7.9	22.6	59.7	39	B	1.5	91.3	2.7	4.0
12	A	90.5	3.4	4.8	1.2	40	A	81.8	7.9	6.6	3.2
13	D	7.2	1.4	6.2	85.2	41	B	1.5	69.5	2.4	26.1
14	D	1.0	24.9	29.9	44.0	42	D	13.8	3.0	5.5	77.0
15	B	4.7	84.4	7.4	3.3	43	A	61.0	5.4	9.9	23.1
16	A	89.3	6.7	2.7	1.2	44	A	77.5	3.8	8.6	9.3
17	D	2.1	4.4	7.7	85.5	45	A	68.7	5.9	11.7	12.9
18	C	18.5	5.8	68.1	7.5	46	A	59.4	33.2	2.3	4.4
19	D	2.2	3.5	7.3	86.9	47	B	3.3	64.5	5.9	25.3
20	B	2.9	76.4	3.2	17.3	48	C	4.1	13.2	79.7	2.1
21	D	11.2	5.7	6.9	76.1	49	B	1.8	91.8	2.7	2.6
22	A	49.0	26.5	21.3	2.7	50	B	11.4	77.2	4.7	5.7
23	C	10.6	13.3	63.2	11.9	51	A	64.3	9.0	8.1	17.2
24	B	12.4	75.3	6.3	5.8	52	C	8.0	6.7	81.5	2.4
25	B	6.8	48.2	37.3	7.4	53	D	5.7	8.3	13.7	70.7
26	D	8.1	29.7	7.0	54.5	54	A	55.2	20.7	18.6	3.6
27	D	10.5	9.0	12.3	67.7	55	C	2.9	4.1	84.7	6.4
28	C	7.2	3.3	85.3	3.9						

*The sum of the percentages for each question may be less than 100% because the No Response category is not included. This category is less than 2% for any one of these questions.

Section 1: Distribution of Jurisdiction Levels of Achievement

Table 13 indicates the percentage of jurisdictions classified as significantly above, not different from, or below the provincial average for each reporting category in Section 1.

Table 13: Grade 6 Mathematics: Section 1
Distribution of Jurisdiction Levels of Achievement

Reporting Category	Distribution of Jurisdictions		
	Below Provincial Average (%)	Not Different from Provincial Average (%)	Above Provincial Average (%)
Section 1 (total)	28.7	48.4	22.9
Subject Matter			
Numeration	30.6	52.1	17.4
Operations and Properties	23.4	52.8	23.9
Measurement	23.7	58.9	17.4
Geometry	18.3	63.0	18.7
Graphing	20.0	55.9	24.1
Problem-Solving Strategies	21.5	64.4	14.2
Cognitive Level			
Knowledge	29.9	52.9	17.2
Comprehension	29.1	49.1	21.8
Application	20.5	57.5	21.9
Problem-Solving Skills	22.8	60.3	16.9

Results for Section 2 - Basic Facts

This section of the test measures student mastery of basic facts; that is, it measures student speed and accuracy.

Results for Speed and Accuracy

Table 14 presents the results in terms of the number of questions the students could answer correctly in 2 minutes, and in terms of the number of questions the students attempted in 2 minutes.

Table 14: Grade 6 Mathematics: Section 2
Speed and Accuracy for Basic Facts

Operations	Number of Questions on the Test	Time Allotted (min)	Average Number of Questions Answered Correctly	Average Number of Questions Attempted
Addition	48	2	37.3	38.1
Subtraction	48	2	35.2	36.6
Multiplication	48	2	40.5	41.7
Division	48	2	35.0	37.4
Mixed Operations	48	2	36.4	38.7

Frequency Distribution of Basic-Fact Scores

Table 15 on page 20 presents total raw scores as well as their relative frequencies for each of the basic-fact tests. Any relative frequency smaller than 0.05 was rounded to 0.0. For example, 9 students or 0.03% obtained a score of 11 on addition, but the relative frequency for this score is recorded as 0.0.

Table 15: Grade 6 Mathematics: Section 2
Relative Frequency Distribution of Basic-Fact Raw Scores

Score	Relative Frequency				
	Addition	Subtraction	Multiplication	Division	Mixed Operations
1	0.0	0.0	0.0	0.0	0.0
2	0.0	0.0	0.0	0.0	0.0
3	0.0	0.0	0.0	0.1	0.0
4	0.0	0.0	0.0	0.1	0.0
5	0.0	0.0	0.0	0.1	0.0
6	0.0	0.0	0.0	0.1	0.0
7	0.0	0.0	0.0	0.2	0.1
8	0.0	0.0	0.0	0.2	0.1
9	0.0	0.0	0.0	0.3	0.1
10	0.0	0.1	0.0	0.3	0.1
11	0.0	0.2	0.1	0.4	0.2
12	0.1	0.2	0.1	0.5	0.3
13	0.1	0.2	0.2	0.6	0.3
14	0.2	0.4	0.2	0.7	0.3
15	0.2	0.6	0.2	0.8	0.5
16	0.3	0.7	0.3	0.9	0.6
17	0.3	0.8	0.3	1.1	0.7
18	0.5	0.9	0.4	1.3	0.9
19	0.5	1.2	0.6	1.6	1.0
20	0.8	1.4	0.6	1.6	1.2
21	0.9	1.8	0.8	1.7	1.3
22	1.2	1.9	0.9	1.8	1.6
23	1.8	2.5	0.9	2.1	1.9
24	2.5	2.9	1.2	2.4	2.2
25	2.2	2.6	1.3	2.2	2.3
26	2.1	2.7	1.2	2.4	2.5
27	2.3	2.7	1.5	2.3	2.5
28	2.7	2.9	1.4	2.7	2.6
29	3.0	3.4	1.5	2.5	2.7
30	3.1	3.5	1.5	2.8	2.9
31	3.4	3.2	1.7	2.8	2.9
32	3.5	3.3	1.9	2.9	3.1
33	3.2	3.4	1.9	3.0	2.9
34	3.3	3.4	2.2	2.9	2.9
35	3.3	3.4	2.4	2.7	2.8
36	3.4	3.6	2.6	2.8	2.8
37	3.0	2.8	2.1	2.3	2.8
38	3.2	2.8	2.2	2.5	2.7
39	3.1	2.6	2.8	2.4	2.6
40	3.1	2.8	2.8	2.7	2.7
41	2.4	2.2	2.8	2.5	2.5
42	2.6	2.2	2.8	2.5	2.8
43	3.0	2.4	3.2	2.7	3.1
44	3.0	2.6	3.7	3.3	3.4
45	3.4	2.8	4.2	3.9	4.2
46	4.8	4.0	6.6	5.4	6.2
47	8.2	6.5	11.9	7.6	9.3
48	15.3	11.9	26.6	11.0	11.1

GRADE 9 SOCIAL STUDIES ACHIEVEMENT TEST

General Description

The Grade 9 Social Studies Achievement Test is a two-part test.
Part A: Multiple Choice consists of 60 questions, worth 70% of the total test score.

Part B: Written Response is worth 30% of the total test score and requires the student to respond to short answer questions and to write a letter to a newspaper editor. All questions in this second part are linked to a current social issue.

Content

The test is based on the *1981 Alberta Social Studies Curriculum*. All test questions are drawn from the content of the three topics prescribed for Grade 9. These topics are: Selected Market Economies, Selected Centrally Planned Economies, and Industrialization in Canada. Content emphasis is derived from the *Grade 9 Social Studies Curriculum Specifications (Revised April 1986)*.

Value, knowledge, and skill objectives are measured in Part A and Part B of the test. Objectives related to the development of attitudes and some participation skills do not form part of this test. Although these objectives are important, questions based on such objectives yield different data than is ordinarily associated with student performance on an achievement test.

Part A: Multiple Choice

The topics and objectives on which the multiple-choice questions of the test are based are shown in the table below.

Table 16: Grade 9 Social Studies - Number and Distribution of Multiple Choice Questions

Content Area	Value Objectives	Knowledge Objectives	Skill Objectives	Total
Topic A	3	8	9	20
Topic B	3	9	8	20
Topic C	3	8	9	20
Total	9	25	26	60

The blueprint for Part A: Multiple Choice is presented in Table 17 on page 22.

TABLE 17: Grade 9 Social Studies - Test Blueprint
Part A: Multiple Choice

CONCEPT REPORTING CATEGORIES / PROCESS REPORTING CATEGORIES	VALUE CONCEPTS: Competing values and value positions	SELECTED MARKET ECONOMIES: Facts, concepts, and generalizations related to selected market economies	SELECTED CENTRALLY PLANNED ECONOMIES: Facts, concepts, and generalizations related to selected centrally-planned economies	INDUSTRIALIZATION IN CANADA: Facts, concepts, and generalizations related to industrialization in Canada	PROPORTION OF TOTAL SCORE
RECALL AND COMPREHENSION: Recalls or recognizes data and transforms data into other words	12, 23, 36, 38, 42, 55, 59	1, 2, 3, 4, 9, 10, 19, 20	24, 25, 26, 27, 29, 30, 31, 32, 33	46, 47, 48, 49, 50, 52, 53, 54	37%
INQUIRY SKILLS I: Identifies an issue, formulates appropriate research questions, and gathers and organizes data	--	5, 16	28, 34, 35, 37	41, 43, 56	11%
INQUIRY SKILLS II: Analyses, evaluates, and synthesizes data	--	6, 7, 8, 17	21, 22, 39, 40	44, 57, 60	13%
INQUIRY SKILLS III: Resolves issues, plans courses of action, and evaluates decisions and courses of action	--	14, 15, 18	--	45, 51, 58	7%
VALUING SKILLS: Analyses competing values	11, 13	--	--	--	2%
PROPORTION OF TOTAL SCORE	10%	20%	20%	20%	70%

Part B: Written Response

The written-response section of the test consists of 5 questions. Questions 1 to 4 require short-answer responses. Question 5 asks the student to write a letter to a newspaper editor. The objectives on which the written-response questions are based are shown in Table 18.

Table 18: Grade 9 Social Studies - Test Blueprint
Part B: Written Response

REPORTING CATEGORY		DESCRIPTION OF WRITING ASSIGNMENT	PROPORTION OF TOTAL SCORE (%)
I.	Short Answer (Identification of the Elements of an Issue)	1. Identifies speakers and value positions. Value objectives -- develop understanding of values and analyse values.	5
		2. Recalls facts related to an issue. Knowledge objectives -- recall knowledge.	4
		3. Identifies possible courses of action. Skill objectives -- analyse and evaluate data.	4
		4. Formulates a generalization -- skill objectives -- synthesize data.	2
		Subtotal	15
II.	Letter (Resolution of an Issue)	5. Present and defend a position. Skill objectives -- resolve the issue and communicate effectively.	15
		Subtotal	15
		TOTAL	30

Absentees and Exemptions

Table 19: Grade 9 Social Studies - Students Tested, Absentees, and Exemptions

	Number of Students	Per Cent
Students tested	27 731	91.7
Students absent	1 113	3.7
Students exempt	1 408	4.6
Special needs	643	2.1
Not taught subject this term	594	1.9
ESL classes	123	0.4
Language of Instruction not English	12	0.0
Other (Approved by Director)	36	0.1

Note: the data are incomplete as not all schools returned absentee and exemption reports.

RESULTS

The report is based on the results for 27 731 Grade 9 students from public, separate, and private schools.

Total Test

The provincial average for the total test, which consisted of multiple-choice and written-response components, was 61.4%. The standard deviation* was 16.6.

The total test score was obtained by combining the scores for Part A: Multiple Choice and Part B: Written Response so that the two parts had weightings of 70% and 30% respectively.

Standards for the Minimum Acceptable and Outstanding Levels of Achievement

The scores representing minimum acceptable and outstanding levels of achievement were established by a standard setting procedure**. For the Grade 9 Social Studies Achievement Test the standards established were as follows:

> To meet the minimum acceptable performance level, students must achieve a raw score of 45.
>
> To meet the outstanding performance level, students must achieve a raw score of 83.

Based on these standards, results were as follows:

> 82.6% of the students performed at or above the minimum acceptable performance level.
>
> 9.6% of the students performed at or above the outstanding performance level.

The percentage of students who obtained each score on the test (relative frequency) and the percentage of students scoring at or below each score (cumulative frequency) are presented in Table 20 on page 26.

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*A measure of the variability of scores. In a normal distribution, 68% of the students' scores would fall within one standard deviation above and below the average.

**An explanation of standard setting procedures is given in Appendix A.

Table 20: Grade 9 Social Studies -
Frequency Distribution of Raw Scores

Raw Score	Relative Frequency (%)	Cumulative Frequency (%)	Raw Score	Relative Frequency (%)	Cumulative Frequency (%)	Raw Score	Relative Frequency (%)	Cumulative Frequency (%)
0	0.0	0.0	34	0.8	6.5	68	2.1	62.3
1	0.0	0.0	35	0.8	7.3	69	2.3	64.6
2	0.0	0.0	36	0.9	8.2	70	2.1	66.7
3	-	-	37	0.9	9.0	71	2.1	68.8
4	0.0	0.0	38	1.1	10.2	72	2.4	71.2
5	-	-	39	1.2	11.3	73	2.1	73.4
6	0.0	0.0	40	1.2	12.5	74	2.1	75.5
7	0.0	0.0	41	1.2	13.7	75	2.2	77.6
8	-	-	42	1.2	14.8	76	2.0	79.6
9	-	-	43	1.3	16.1	77	2.0	81.6
10	-	-	44	1.3	17.4	78	1.8	83.4
11	0.0	0.0	45	1.3	18.7	79	1.8	85.2
12	-	-	46	1.4	20.1	80	1.8	87.0
13	-	0.1	47	1.4	21.6	81	1.7	88.7
14	-	0.1	48	1.5	23.1	82	1.6	90.4
15	-	0.1	49	1.6	24.7	83	1.4	91.8
16	-	0.2	50	1.7	26.4	84	1.3	93.1
17	0.1	0.2	51	1.7	28.1	85	1.2	94.2
18	0.1	0.3	52	1.7	29.8	86	1.0	95.3
19	0.1	0.4	53	1.8	31.7	87	0.9	96.1
20	0.1	0.5	54	1.9	33.5	88	0.9	97.0
21	0.2	0.7	55	1.9	35.5	89	0.8	97.7
22	0.2	0.9	56	1.8	37.3	90	0.5	98.3
23	0.2	1.1	57	2.0	39.3	91	0.5	98.7
24	0.3	1.4	58	2.1	41.3	92	0.4	99.1
25	0.3	1.7	59	2.0	43.4	93	0.3	99.4
26	0.3	2.0	60	2.0	45.4	94	0.2	99.7
27	0.4	2.3	61	2.1	47.5	95	0.2	99.8
28	0.4	2.7	62	2.2	49.7	96	0.1	99.9
29	0.5	3.3	63	2.2	51.8	97	-	99.9
30	0.6	3.8	64	2.1	53.9	98	-	100.0
31	0.7	4.5	65	2.1	56.0	99	-	100.0
32	0.6	5.1	66	2.0	58.0	100	-	100.0
33	0.7	5.8	67	2.2	60.2			

Any score that was achieved by fewer than 0.05% of the population is represented by a dash (-). It should be noted, therefore, that the range of student scores was from 3 to 100, although the relative frequencies at the extreme ends of the distribution do not appear to indicate this. For example, one student achieved a raw score of 3 but, since this represents fewer than 0.05% of the population, the relative frequency is shown by a dash (-).

Table 21 provides averages and standard deviations for the multiple-choice and written-response questions. Averages are in raw scores, which are the average number of marks obtained on each part of the test.

Table 21: Grade 9 Social Studies -
Multiple Choice and Written Response Raw Score Totals

Test Section	Total Possible Marks	Weighting (%)	Raw Score Average	Standard Deviation
Multiple Choice	60	70	38.5	10.3
Written Response	30	30	16.6	5.9

Table 22 contains the scores representing the minimum acceptable and outstanding levels of achievement on the multiple-choice and written-response portions of the test, as well as the percentages of students who achieved these standards.

Table 22: Grade 9 Social Studies -
Comparison of Performance to Standards:
Multiple Choice and Written Response

	Minimum Acceptable Level		Outstanding Level	
	Raw Score Representing Standard	Students Meeting Standard (%)	Raw Score Representing Standard	Students Meeting Standard (%)
Multiple Choice	29	81.0	50	16.0
Written Response	12	80.7	25	8.4

Results for Part A: Multiple Choice

The results for Part A are summarized by reporting category in Table 23. Although performance in the different reporting categories appears to show some variation, it is important to note that these scores are not directly comparable. The sets of questions that make up each reporting category were not selected to be equal in their average level of difficulty, therefore differences may be due to variations in question difficulty rather than in student performance. The averages can be used, however, in combination with jurisdiction results to detect patterns of relative strength or weakness in achievement in each of the reporting categories.

Table 23: Grade 9 Social Studies - Results by Reporting Category
Part A: Multiple Choice

Reporting Category	No. of Questions	Raw Score Average	Standard Deviation
1. Total Score (Multiple Choice)	60	38.5	10.3
2. Topic A: Selected Market Economies	20	13.2	3.6
3. Topic B: Selected Centrally-Planned Economies	20	12.8	3.9
4. Topic C: Industrialization in Canada	20	12.6	4.1
5. Recall and Comprehension			
All Topics	25	15.8	4.6
Topic A	8	5.1	1.8
Topic B	9	5.4	2.0
Topic C	8	5.4	1.9
6. Value Concepts and Valuing Skills (all topics)	9	5.7	2.1
7. Inquiry Skills I (all topics)	9	5.4	2.1
8. Inquiry Skills II (all topics)	11	7.8	2.2
9. Inquiry Skills III (all topics)	6	3.8	1.4

Table 24 shows the frequency distribution of raw scores on Part A of the test.

Table 24: Grade 9 Social Studies - Frequency Distribution of Raw Scores
Part A: Multiple Choice

Raw Score	Relative Frequency (%)	Cumulative Frequency (%)	Raw Score	Relative Frequency (%)	Cumulative Frequency (%)	Raw Score	Relative Frequency (%)	Cumulative Frequency (%)
0	0.0	0.0	20	1.0	5.3	40	3.5	53.6
1	-	-	21	1.3	6.5	41	3.2	56.8
2	0.0	-	22	1.4	8.0	42	3.4	60.2
3	-	-	23	1.5	9.5	43	3.6	63.8
4	0.0	-	24	1.5	11.0	44	3.5	67.2
5	-	-	25	1.9	12.9	45	3.4	70.6
6	0.0	-	26	2.0	14.9	46	3.6	74.2
7	-	-	27	2.2	17.1	47	3.2	77.4
8	-	-	28	1.9	19.0	48	3.4	80.8
9	-	0.1	29	2.2	21.2	49	3.2	84.0
10	-	0.1	30	2.5	23.7	50	3.1	87.2
11	0.1	0.2	31	2.6	26.3	51	2.7	89.8
12	0.1	0.3	32	2.7	29.0	52	2.5	92.4
13	0.2	0.5	33	2.8	31.8	53	2.2	94.5
14	0.3	0.8	34	2.9	34.7	54	1.9	96.4
15	0.4	1.2	35	2.8	37.6	55	1.5	97.9
16	0.4	1.6	36	3.0	40.6	56	0.9	98.8
17	0.7	2.4	37	3.2	43.8	57	0.7	99.5
18	0.9	3.3	38	3.2	46.9	58	0.3	99.8
19	0.9	4.2	39	3.2	50.1	59	0.1	100.0
						60	-	100.0

*Relative Frequency: the percentage of students achieving each score.
**Cumulative Frequency: the percentage of students achieving at or below each score.

Any score that was achieved by fewer than 0.05% of the population is represented by a dash (-). It should be noted, therefore, that the range of scores was from 1 to 60, although the relative frequencies at the upper and lower ends of the distribution do not appear to indicate this. For example, five (5) students achieved a raw score of 60 but, since this represents fewer than 0.05% of the population, the relative frequency is shown by a dash (-).

The response frequencies for all 60 multiple-choice questions appearing in the test are presented in Table 25.

Table 25: Grade 9 Social Studies - Response Frequencies
Part A: Multiple Choice

Item Number	Key	Distribution of Responses (%)*				Item Number	Key	Distribution of Responses (%)*			
		A	B	C	D			A	B	C	D
1	C	8.2	41.8	42.3	7.3	31	A	59.2	9.0	12.4	19.3
2	B	15.2	38.2	25.2	21.1	32	B	7.4	70.1	3.4	19.0
3	A	62.4	10.5	7.6	19.1	33	A	35.1	33.6	19.2	12.0
4	A	82.7	6.1	8.8	2.3	34	B	32.8	41.2	11.5	14.4
5	A	68.1	23.2	3.8	4.9	35	C	14.4	11.9	64.8	8.7
6	D	7.2	11.7	4.2	76.8	36	C	4.7	4.8	70.3	20.1
7	C	9.9	5.2	79.5	5.4	37	D	14.1	11.7	4.8	69.4
8	B	9.2	79.9	3.9	6.9	38	A	61.5	8.6	15.9	13.9
9	D	4.0	3.0	5.9	86.9	39	B	14.5	78.8	4.0	2.6
10	A	70.3	16.6	9.7	3.4	40	D	6.7	6.0	14.9	72.3
11	C	17.4	15.5	57.8	9.1	41	D	10.3	15.8	10.7	63.0
12	B	2.3	78.0	17.8	1.9	42	C	17.8	18.7	47.0	16.3
13	C	14.1	16.4	56.1	13.3	43	C	9.4	16.9	67.3	6.3
14	B	30.6	59.8	4.8	4.7	44	B	9.9	52.2	25.9	11.8
15	C	5.5	36.8	43.8	13.7	45	A	41.4	21.2	12.9	24.3
16	D	18.9	10.7	5.5	64.7	46	B	11.9	62.1	10.9	14.9
17	A	73.2	3.4	17.5	5.9	47	D	20.1	12.8	7.4	59.5
18	B	4.2	72.7	17.6	5.3	48	C	7.2	10.5	71.9	10.2
19	A	60.5	10.6	18.3	10.5	49	D	10.5	12.9	5.5	70.9
20	D	11.3	11.0	15.1	62.4	50	C	19.1	13.7	60.6	6.3
21	D	4.8	6.8	14.4	73.9	51	B	8.9	75.1	9.4	6.4
22	A	83.0	6.8	7.0	3.1	52	D	7.9	6.8	17.0	68.1
23	B	11.4	59.5	9.7	19.3	53	B	6.6	71.4	10.0	11.7
24	D	13.0	13.7	10.9	62.3	54	A	76.5	7.0	11.7	4.7
25	C	7.3	5.9	73.4	13.3	55	A	75.7	8.6	7.9	7.6
26	C	10.1	26.2	54.4	9.2	56	A	38.4	9.2	44.7	7.5
27	D	20.1	14.7	7.4	57.7	57	D	12.3	19.4	13.5	54.5
28	A	63.7	27.3	5.0	3.9	58	D	6.3	5.2	4.6	83.7
29	B	14.0	41.2	32.7	11.9	59	D	10.2	7.7	22.0	59.8
30	C	4.7	7.9	83.3	4.0	60	C	14.4	8.1	60.3	17.0

*The sum of the percentages may be less than 100% because the No Response category is not included and the numbers have been rounded.

Results for Part B: Written Response

The results for the written-response questions are summarized, by question, in Table 26.

Table 26: Grade 9 Social Studies -
Average Scores Awarded for Written-Response Questions

Question	Total Marks Possible	Average Score	Difficulty Level*
Short Answer			
1	5	3.5	0.70
2	4	1.9	0.49
3	4	2.2	0.55
4	2	0.8	0.40
Letter			
5	15	8.1	0.54

*The difficulty level is the average score divided by total marks possible.

The distribution of scores for the short-answer written-response questions (questions 1 to 4) are presented in Table 27.

Table 27: Grade 9 Social Studies - Distribution of Scores for Short-Answer Written-Response Questions

	Percentage of Students Obtaining Each Mark						
		Score					
Question	NR*	0	1	2	3	4	5
1	1.2	2.9	8.9	9.8	19.7	23.5	34.0
2	5.8	15.1	19.4	22.8	17.9	18.9	-
3	5.0	8.0	16.9	28.4	21.2	20.5	-
4	12.2	36.0	22.5	29.1	-	-	-

*No Response

The distribution of scores for the letter (question 5) are presented in Table 28.

Table 28: Grade 9 Social Studies - Distribution of Scores on Question 5

Scale Points	Distribution of Responses (%)
5 (Excellent)	4.8
4 (Good)	16.0
3 (Satisfactory)	38.1
2 (Limited)	30.6
1 (Poor)	6.8
0 (Off topic, insufficient response, or blank paper)	3.6*

*2.6% of the total papers were blank on Question 5.

Distribution of Jurisdiction Levels of Achievement

Table 29 indicates the percentage of jurisdictions classified as significantly above, not different from, or below the provincial average for each subtest.

Table 29: Grade 9 Social Studies - Distribution of Jurisdiction Levels of Achievement

Reporting Category	Distribution of Jurisdictions (%)		
	Below Provincial Average	Not Different from Provincial Average	Above Provincial Average
Total Test	24.0	54.9	21.1
Multiple Choice			
Total Score	25.5	53.9	20.6
Topic A: Selected Market Economies	24.6	59.1	16.3
Topic B: Selected Centrally-Planned Economies	24.5	60.3	15.2
Topic C: Industrialization in Canada	21.3	60.4	18.3
Recall and Comprehension:			
All Topics	29.1	52.2	18.7
Topic A	32.0	57.1	10.8
Topic B	26.4	55.2	18.4
Topic C	21.7	59.1	19.2
Value Concepts and Valuing Skills (all topics)	22.1	65.2	12.7
Inquiry Skills I (all topics)	17.8	67.8	14.4
Inquiry Skills II (all topics)	12.4	65.3	22.3
Inquiry Skills III (all topics)	16.0	70.0	14.0
Written Response			
Total Score	22.5	57.8	19.6
Short Answer Questions	20.6	62.7	16.7
Letter	23.0	69.6	7.4

GUIDE TO THE INTERPRETATION OF JURISDICTION RESULTS

In addition to their use in monitoring student achievement for the province as a whole, the results of the achievement tests are useful in comparing achievement in a particular jurisdiction with provincial results. However, care must be exercised in making these comparisons and in drawing conclusions from the data.

The following jurisdiction and school reports for each subject are provided for each jurisdiction under separate covers.

1. The Jurisdiction Summary Report contains jurisdiction equivalents of the provincial results that are given in all statistical tables in the report.

2. The School Summary Report contains the school equivalents of the provincial results that are given in all statistical tables in this report.

3. Individual Student Subtest Results are reported for each school.

These reports are confidential to the jurisdiction.

Differences Between Jurisdiction and Provincial Averages

Jurisdictions are provided with their average scores for each reporting category. These scores may be compared to the provincial average for the same reporting category. However, the importance of differences between jurisdiction averages and provincial averages is not always clear. To aid in the interpretation of differences between the averages, jurisdiction and school reports indicate when the difference is unlikely to be due to chance variation in the abilities of students. For the purposes of the provincial testing program, the 95% confidence interval is used. That is, if the probability is less than 1 in 20 that the difference is due to chance, the difference is very likely a real difference, and the jurisdiction average is classified as different from the provincial average. Otherwise, it is classified as not different from the provincial average. The provincial average for that reporting category determines the true population average. The standard deviation for the jurisdiction is used to estimate the standard error of the mean.

Because achievement levels are calculated by taking jurisdiction size into consideration, two jurisdictions with the same averages but of different sizes may be classified differently. The larger jurisdiction would be more likely to be above or below average, because the amount of chance variation would be less in larger jurisdictions, and the actual difference would represent a larger variation from the provincial average.

A test score does not indicate why a particular performance occurred, only that it did occur. Identification of reasons for that performance should be undertaken only when the results have been studied. There are a variety of factors that should be examined:

1. Student motivation. Consideration should be given to the degree to which students were motivated to perform to their levels of ability.

2. Student ability. While the notion of confidence interval is designed to take into consideration year-to-year fluctuations in the average ability levels of students, it is possible that a group of students with a particularly high or low average ability may come through a system. This is much more likely to be a factor in small systems than in large ones.

3. Teaching and curriculum. Consideration should be given to the type of instruction students have received in the jurisdiction and the adequacy of curriculum implementation.

APPENDIX A: STANDARD SETTING PROCEDURE

Provincial averages are useful for comparing the performance of students in a school or jurisdiction to overall levels of achievement. However, if used alone, provincial averages do not indicate whether achievement levels are what they should be. A test score by itself has limited meaning without comparison to a standard. A raw score of 25/50, for example, could represent very high achievement on one test, and very low achievement on another.

Grade 3 Science and Grade 6 Mathematics

For the Grade 3 Science and the Grade 6 Mathematics, identical procedures were used to establish standards that allow for the assessment of achievement on the respective tests. The Student Evaluation and Records Branch asked 30 experienced Grade 3 Science and Grade 6 Mathematics teachers respectively to examine each question on the test and determine the expected difficulty level of that question for two groups of students: borderline passing students and borderline outstanding students. From the individual question difficulty levels, the overall test difficulty levels expected for these two groups of students were determined. The averages of the test difficulty levels established by the teachers provided the standards for minimum acceptable performance and outstanding performance on the test.

Grade 9 Social Studies

For the Grade 9 Social Studies test, experienced Grade 9 teachers from all parts of the province met to determine what raw score would be expected on the test for two categories of borderline student. The minimum acceptable borderline is the division between the student who could be expected to minimally achieve the objectives, and one who could not. The outstanding borderline divides students who could be expected to achieve an outstanding level of performance and those who could not.

After a review of the prescribed curriculum, it was judged that, given adequate teaching and resources, 85% of the Grade 9 students should be able to minimally achieve the objectives of the Grade 9 Social Studies curriculum, as reflected by the achievement test. Since 85% of the students should be able to reach this level, the borderline student would be at the 15th percentile in ability. The outstanding borderline student would be at the 85th percentile since it was judged that 15% of the students should be able to reach this level given adequate teaching and resources.

The teachers examined each question on the test and determined the difficulty of that question for a 15th percentile student. (Question 5 on the written-response section of the test was excluded from this process, as an implicit standard is built into the scoring guide.) From difficulty levels of individual questions, the overall test difficulty for the minimally acceptable borderline student was determined. The average of the difficulty levels established by the teachers is the standard for the test. For the borderline outstanding student, global judgments about the difficulty of the total test and its two major subsections were made following the previous item-by-item review of the test.